

Software Agents for Group Awareness and Inter-agent Conflict Management, Phase I

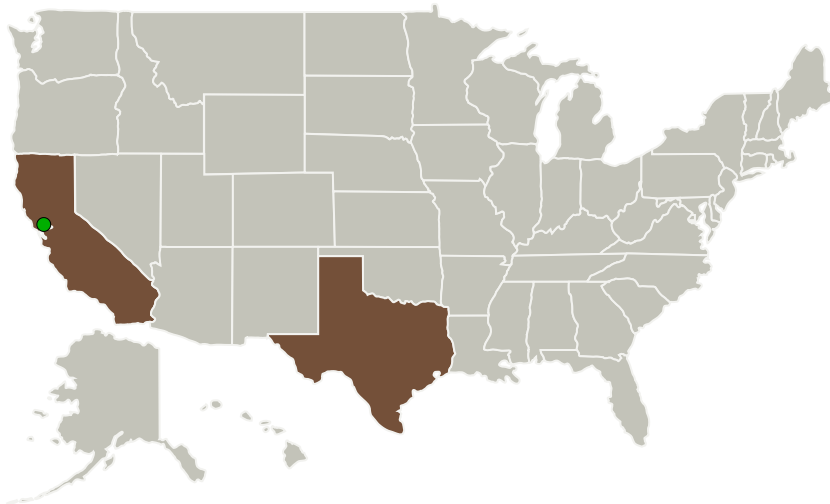
Completed Technology Project (2010 - 2010)



Project Introduction

NASA is investigating robots for a variety of tasks in space, including astronaut transport, habitat construction, site survey, and robotic reconnaissance. These robots may be supervised locally by astronauts or remotely by Earth-based controllers. Thus surface operations are expected to be multi-agent, with heterogeneous robots operating concurrently and supervised from remote locations subject to different communication delays. Technologies are needed to help humans understand how multi-agent operations are proceeding and to detect inter-agent conflicts before they impact operations significantly. TRAC Labs will develop assistive software agents that monitor human-robot interaction and communication during multi-agent operations (1) to construct an integrated view of agent operations in the presence of significant time delay and (2) to detect inter-agent conflicts that may affect the ability to complete operations. To assess the effectiveness of these assistive agents, Omnisen will develop evaluator software agents that model work practice during multi-agent operations. These evaluator agents will stand in for humans using the assistive agents in representative scenarios to assess the effectiveness of the assistive agents and identify best work practice when using them. The extensive experience of this team in software agents, remote supervision of robots, and human-computer interaction enables the successful development of the proposed technology.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
TRAC Labs, Inc.	Lead Organization	Industry	Webster, Texas
● Ames Research Center (ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Texas

Project Transitions

**January 2010:** Project Start**July 2010:** Closed out

Closeout Summary: Software Agents for Group Awareness and Inter-agent Conflict Management, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image (<https://techport.nasa.gov/file/139469>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

TRAC Labs, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

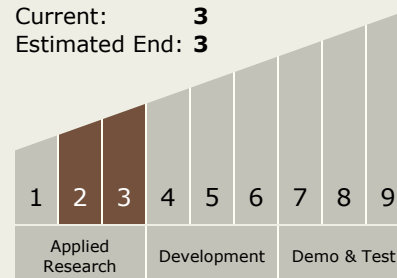
Carlos Torrez

Principal Investigator:

Debra L Schreckenghost

Technology Maturity (TRL)

Start: 2
Current: 3
Estimated End: 3



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.6 Human Systems Integration
 - └ TX06.6.1 Human Factors Engineering

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System